

The geometry of holomorphic and algebraic curves in
complex algebraic varieties

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The Gauss map of algebraic minimal surfaces

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Abstract

The well-known result of Fujimoto says that the Gauss map of a non-flat complete minimal surface M in \mathbb{R}^3 can omit at most 4 values, and this is sharp. Here we consider an open problem in the algebraic case. A complete minimal surface with finite total curvature is called *algebraic*. Osserman shows that the Gauss map in this case can omit at most 3 values. Many people believe that the sharp estimate is 2.

However, Y. Kawakami found an algebraic minimal surface which has the total ramification value number 2.5, where TRVN gives more detailed information than the exceptional value numbers. Motivated by this, we found an invariant R given by the ratio of the areas of M , the one with respect to the induced metric by the Gauss map, and the other to the hyperbolic metric when M is of hyperbolic type, which is our concern. This ratio gives a good estimate of TRVN, including a sharp one in some cases.

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